

Claims

- [c1] 1.A pre-crash sensing system coupled to a counter-measure system for sensing an object comprising:
a vision system producing a plurality of frames at a rate of at least about 100 frames per second;
a video processor coupled to said vision system, said video processor determining a distance, velocity and an acceleration of the object from said plurality of frames;
and
a controller coupled to said vision system for deploying said counter measure in response to said object distance, object velocity and said object acceleration.
- [c2] 2.A system as recited in claim 1 wherein said vision system comprises a right side camera, and a left side camera.
- [c3] 3.A system as recited in claim 2 wherein said vision system comprises a front camera.
- [c4] 4.A system as recited in claim 3 wherein said front camera comprises a stereo pair of cameras.
- [c5] 5.A system as recited in claim 1 further comprising a forward looking radar-based system.
- [c6] 6.A system as recited in claim 1 wherein said counter measure comprises an airbag controller and an airbag, said airbag controller coupled to said airbag.
- [c7] 7.A system as recited in claim 6 wherein said airbag comprises a side airbag.
- [c8] 8.A system as recited in claim 7 wherein said side airbag comprises a side curtain airbag.
- [c9] 10.A pre-crash side-impact sensing system for an automotive vehicle for sensing an object comprising:
a camera vision system producing a plurality of frames at a rate of at least about 100 frames per second;
a video processor coupled to said vision system, said video processor determining a distance, velocity and an acceleration of the object from said plurality of frames;

and

a controller coupled to said vision system for deploying said counter measure in response to said object distance, object velocity and said object acceleration.

[c10] 11.A system as recited in claim 10 wherein said vision system comprises a right side camera, and a left side camera.

[c11] 12.A system as recited in claim 11 wherein said vision system comprises a front camera.

[c12] 13.A system as recited in claim 12 wherein said front camera comprises a stereo pair of cameras.

[c13] 14.A system as recited in claim 10 further comprising a forward looking radar-based system.

[c14] 15.A system as recited in claim 10 wherein said counter measure comprises an airbag controller and an airbag, said airbag controller coupled to said airbag.

[c15] 16.A system as recited in claim 15 wherein said airbag comprises a side airbag.

[c16] 17.A system as recited in claim 16 wherein said side airbag comprises a side curtain airbag.

[c17] 18.A method for operating a pre-crash sensing system for an automotive vehicle having a counter-measure system, said method comprising:
generating a plurality of images of the object from an image device having a frame rate of at least 100 frames per second camera;
determining an object distance with the image device;
determining an object speed and acceleration with the image device as a function of frame rate; and
activating the counter measure system in response to the object size, object distance and object acceleration.

[c18] 19.A method as recited in claim 10 wherein deploying the counter-measure comprises deploying an airbag.

[c19] 20.A method as recited in claim 18 wherein deploying an airbag comprises

deploying a side airbag.

[c20] 21.A method as recited in claim 18 wherein deploying a side airbag comprises
deploying a side curtain airbag.

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